CLAIMS

WHAT IS CLAIMED IS:

1. A method of testing a planar lightwave circuit comprising:

creating a first probe region of a top surface of the planar lightwave circuit by removing a portion of cladding from the top surface of the planar lightwave circuit;

coupling a first optical probe to the first probe region; and

testing an optical pathway within the planar lightwave circuit by transmitting or receiving light through the first optical probe.

2. The method of claim 1 further comprising:

creating a second probe region of the top surface of the planar lightwave circuit;

coupling a second optical probe to the second probe region; and

using the second optical probe in combination with the first optical probe to send and receive a light signal through the planar lightwave circuit.

3. The method of claim 2 further comprising:

changing an input angle of the light signal to test a second optical pathway within the planar lightwave circuit without moving the first optical probe or the second optical probe.

4. The method of claim 1 further comprising:

using an index-matching fluid as an interface between the first optical probe and the first probe region.

5. The method of claim 1 further comprising:

removing the first probe region from the planar lightwave circuit.

6. The method of claim 1 further comprising:

filling in the first probe region from the planar lightwave circuit with index-matching fluid.

7. A method of testing a planar lightwave circuit having first and second surface regions, the first and second surface regions having an upper cladding thickness of approximately 2 microns or less, the method comprising:

coupling a first optical probe to the first surface region;

directing light through the first optical probe into the planar lightwave circuit;

coupling a second optical probe to the second surface region; and

receiving the light through the second optical probe.

8. The method of claim 7, wherein at least one of the first and second surface regions is near an edge of a planar lightwave circuit die.

9. The method of claim 7, wherein directing light through the first optical probe further comprises:

directing light through a rounded top portion of the first optical probe.

10. The method of claim 9 further comprising:

directing light into a first waveguide in a bottom portion of the first optical probe.

11. The method of claim 10 further comprising:

directing light into a second waveguide in the bottom portion of the first optical probe by changing an input angle of the light.

12. The method of claim 7 further comprising:

using an index-matching fluid as an interface between the first optical probe and the first surface region.

13. The method of claim 7, wherein testing the planar lightwave circuit is performed on a wafer prior to dicing the wafer.

14. The method of claim 7, wherein testing the planar lightwave circuit is performed on a die prior to permanently attaching optical fibers to the die.

15. The method of claim 7, wherein testing the planar lightwave circuit is performed on a die after permanently attaching optical fibers to the die.

16. An optical probe comprising:

a prism having a rounded top; and

a first waveguide in a bottom portion of the prism, the rounded top to focus light entering the prism into first waveguide.

17. The optical probe of claim 16, wherein the prism is at least partially made of sapphire, high density glass, $LiNbO_3$, or rutile.

18. The optical probe of claim 16, further comprising:

a second waveguide in the bottom portion of the prism, wherein the rounded top constitutes more than one focus to couple light into the first waveguide and the second waveguide.

19. The optical probe of claim 16, wherein light entering the rounded top is re-directed approximately 90 degrees by the prism and the first waveguide.

20. The optical probe of claim 16, wherein the rounded top comprises a microlens array.

21. A method of making an optical probe, the method comprising:

forming a lens surface on a prism; and

forming a waveguide in a bottom portion of the prism.

22. The method of claim 21, wherein the waveguide is formed by diffusion or ion exchange.

23. The method of claim 21, wherein the waveguide is formed by ion implantation.

24. The method of claim 21, wherein the waveguide is formed by deposition.

25. The method of claim 21 further comprising:

forming a second waveguide in the bottom portion of the prism.

26. The method of claim 21, wherein forming the lens surface on the prism further comprises

forming a lens surface having more than one focus.

27. The method of claim 21, wherein forming the lens surface on the prism further comprises

forming a lens surface having a microlens array.